AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (currently amended): A method for making three-dimensional structures of nanometric or micrometric dimensions, wherein the three-dimensional structures are surface projections having a height of up to 500 microns and having defined geometries, wherein the method comprises the following steps:

(a) obtaining of a photopolymerizable mixture including nanoparticles orientable in space;

(b) deposition of the mixture on a substrate to form a layer;

(c) exposure of the layer to UV-radiation and control of state of polymerization ~~by means of~~based on variation of the index of refraction of the layer;

(d) application of a magnetic and/or electrical field to the layer to produce a desired orientation or positioning of the nanoparticles and to induce the growth of the surface projections from the layer; and

(e) polymerization of the mixture,

wherein the nanometric dimensions are dimensions from about 50 nm to 1 μm, and the micrometric dimensions are dimensions from about 50 μm to about 500 μm.

2. (previously presented): The method according to Claim 1, wherein the exposure of the layer to UV-radiation is concomitant with the application of the magnetic and/or electrical field.

3. (previously presented): The method according to Claim 1, wherein the exposure of the layer of the mixture to UV-radiation and the application of the magnetic and/or electrical field occur in an oxygen-free environment.

4. (previously presented): The method according to Claim 1, wherein the UV radiation is localized in the areas in which the surface projections are to be formed.

5. (previously presented): The method according to Claim 4, wherein the UV radiation is localized by means of a binary mask or a half-tone mask.

6. (previously presented): The method according to Claim 1, wherein the layer is exposed to non-uniform UV radiation, with a consequent non-uniformity in the formation of polymeric lattice between areas of the layer most illuminated by UV radiation and areas of the layer least illuminated by UV radiation.

7. (currently amended): The method according to Claim 6, wherein the control of state of polymerization is carried out by detection of the variation of the index refraction of the

layer in the areas with different degrees of cross-linking and consequent modification of the intensity of the magnetic or electrical field.

8. (previously presented): The method according to Claim 1, wherein the exposure of the layer to UV-radiation transforms the mixture from a liquid state to a gelatinous state.

9. (previously presented): The method, according to Claim 8, wherein the application of a magnetic and/or electrical field is carried out by application of a localized magnetic field by means of a magnetic tip.

10. (previously presented): The method according to Claim 9, wherein the tip has a nanometric dimension, is made of silicon, and is coated with a magnetic film, wherein the nanometric dimension is a dimension of 20-30 nm.

11. (previously presented): The method according to Claim 1, wherein the polymerization of the mixture is carried out by means of exposure thereof to UV radiation in the absence of application of the magnetic and/or electrical field.

12. (previously presented): The method according to Claim 11, wherein the polymerization of the mixture is carried out by means of localized exposure of the projections to UV radiation in the absence of the magnetic and/or electrical field.

13. (previously presented): The method according to Claim 9, wherein the polymerization of the mixture is carried out by focusing a beam of UV radiation in the proximity of the tip to enable cross-linking of the projections.

14. (previously presented): The method according to Claim 1, wherein the photopolymerizable mixture comprises acrylated oligomers and monomers.

15. (previously presented): The method according to Claim 1, wherein the orientable nanoparticles are selected from the group consisting of ferrofluids, electro-rheological materials, liquid crystals and magneto-rheological materials.

16. (withdrawn): A solid component having three-dimensional surface structures of nanometric or micrometric dimensions, in particular having one or more surfaces in which there are defined projections having a height of up to 500 micron arranged according to definite geometries, obtained in accordance with the method according to claim 1.

17. (withdrawn): A solid component having at least one surface from which there rise projections having a height of up to 500 micron arranged according to definite geometries, wherein it is at least in part made using a photopolymer to which are added nanoparticles orientable in space by means of magnetic and/or electrical fields, the concentration of orientable nanoparticles being greater at the projections.

18. (withdrawn): The component according to Claim 17, in which the photopolymer has a base of oligomers and monomers.

19. (withdrawn): The component according to Claim 17, in which the orientable nanoparticles are selected in the group consisting of ferrofluids, electro-rheological materials, liquid crystals and magneto-rheological materials.

20. (withdrawn): An apparatus for the implementation of the method according to Claim 1.

21. (withdrawn): The apparatus according to Claim 20, comprising:

a support for deposition of a layer of a photopolymeric or UV mixture including nanoparticles orientable in space;

- means for exposing the layer to UV-radiation;

means for controlling the polymerization of the mixture by means of variation of its index of refraction;

- means for applying a magnetic and/or electrical field capable of producing a desired orientation or positioning of the nanoparticles of the mixture in order to induce the growth of surface projections from the layer; and

- means for carrying out polymerization of the mixture.

22. (new): A method for making three-dimensional structures of micrometric dimensions, wherein the three-dimensional structures are surface projections having a height of up to 500 microns and having defined geometries, wherein the method comprises the following steps:

(a) obtaining of a photopolymerizable mixture including nanoparticles orientable in space;

(b) deposition of the mixture on a substrate to form a layer;

(c) exposure of the layer to UV-radiation;

(d) application of a magnetic and/or electrical field to the layer to produce a desired orientation or positioning of the nanoparticles and to induce the growth of the surface projections from the layer; and

(e) polymerization of the mixture,

wherein the micrometric dimensions are dimensions from about 50 μm to about 500 μm,

state of polymerization of the layer is controlled by monitoring variation of the index of refraction thereof, and consequently modifying intensity of the applied magnetic or electrical field,

and wherein

the layer is exposed to non-uniform UV radiation, thereby producing a non-uniformity in polymeric lattice formation between areas of the layer most illuminated by UV radiation and areas of the layer least illuminated by UV radiation, and

variation of the index refraction is monitored by detecting intensity distribution of orders of diffraction in areas of the layer having different degrees of cross-linking.

23. (new): A method for making three-dimensional structures of nanometric dimensions, wherein the three-dimensional structures are surface projections having a height of up to 1 micron and having defined geometries, wherein the method comprises the following steps:

(a) obtaining of a photopolymerizable mixture including nanoparticles orientable in space;

(b) deposition of the mixture on a substrate to form a layer;

(c) exposure of the layer to UV-radiation and control of polymerization state thereof;

(d) application of a magnetic field to the layer to produce a desired orientation or positioning of the nanoparticles and to induce the growth of the surface projections from the layer; and

(e) polymerization of the mixture,

wherein the nanometric dimensions are dimensions from about 50 nm to 1 μm,

step (c) comprises pre-polymerization of the mixture to transform the mixture from a liquid state to a gelatinous state,

step (d) comprises application of a localized magnetic field to the layer by means of a magnetic tip to induce growth of a projection, and

step (e) comprises focusing a beam of UV-radiation in the proximity of the tip, to enable cross-linking of the projection.